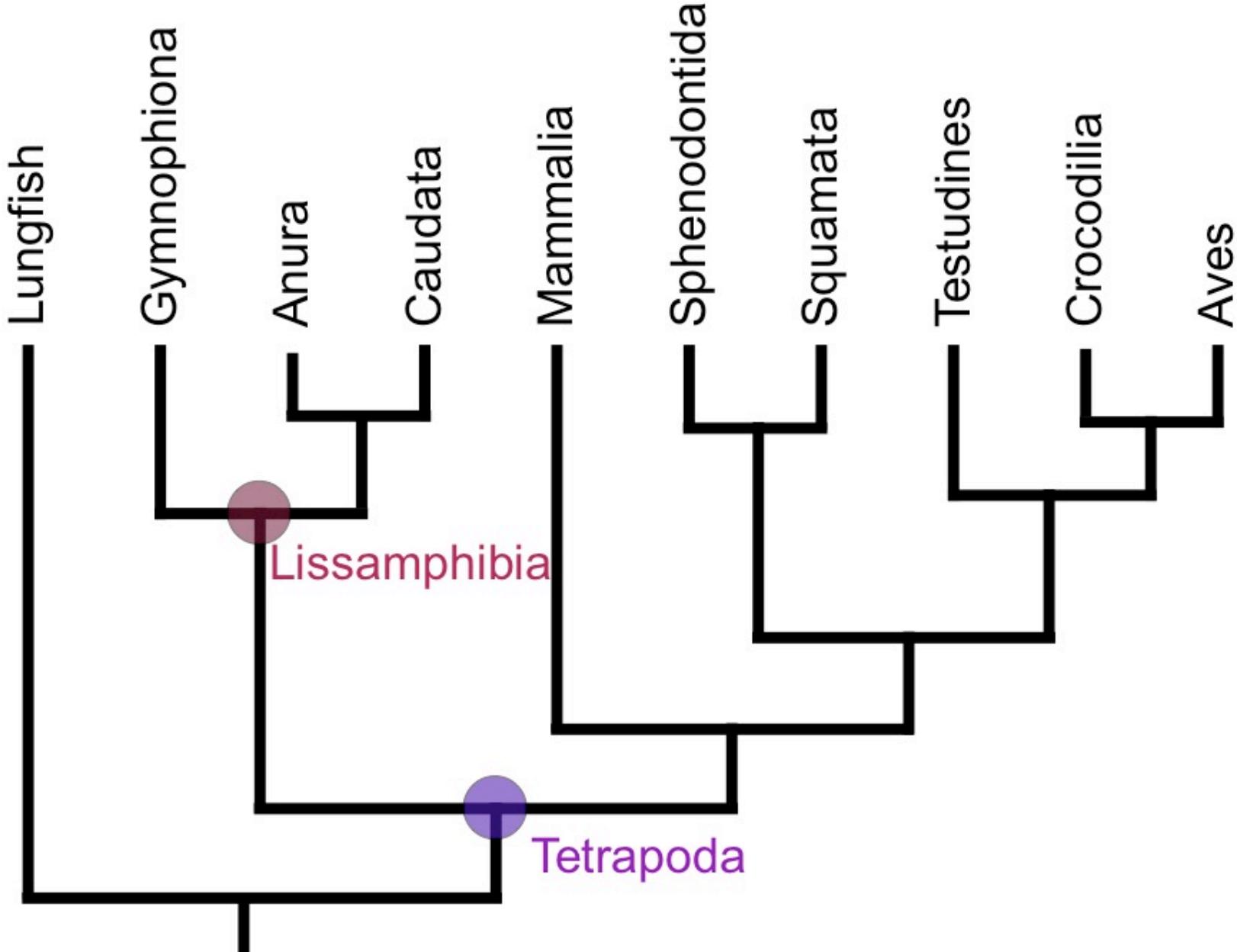




alamander Diversity

Systematics of living “herps”



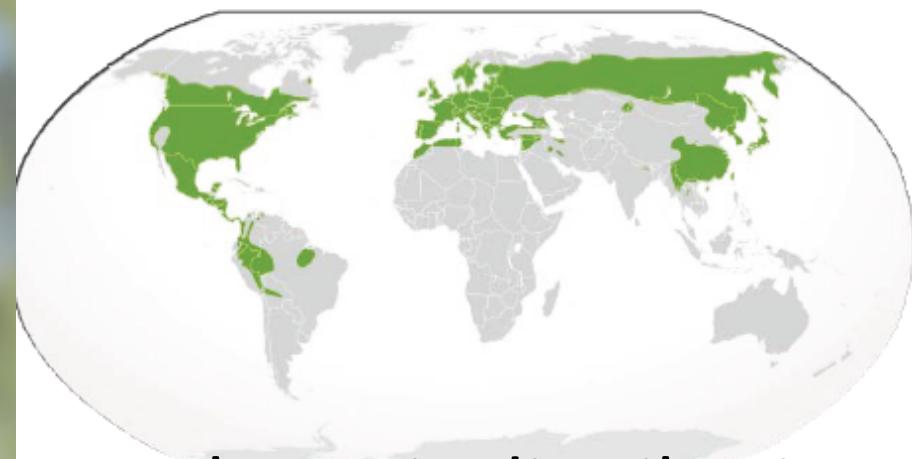
- 10 Families
- 68 Genera
- 686 Species (as of 9/29/16)



J. Uyeda

Order: Caudata

~ 9% of Amphibian diversity



- Holoarctic distribution
- Mostly temperate and subtropical
- MOIST habitats

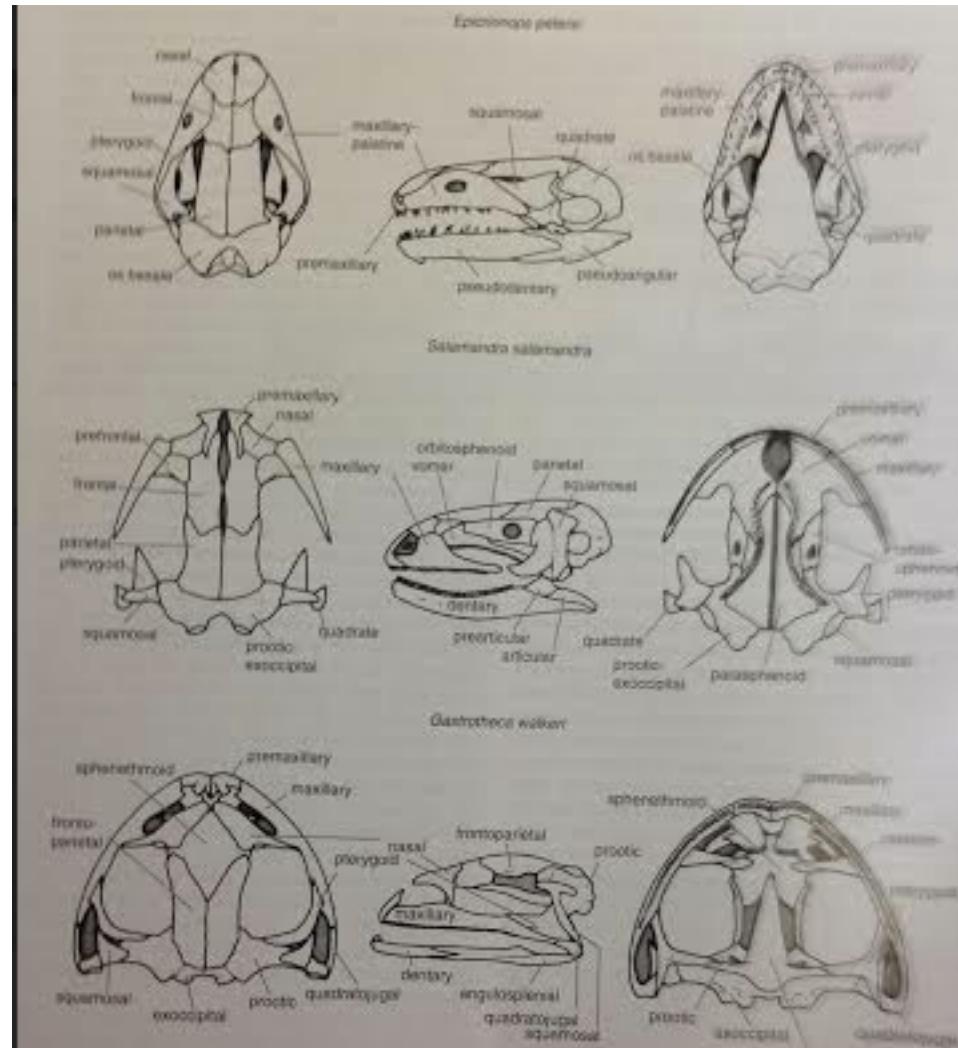
Diagnostic Characteristics

- Distinct Head, Trunk, and Tail
- Four limbs; Hind limbs not larger than forelimbs (*may be reduced or absent in some spp)
- Toes WITHOUT claws



Diagnostic Characteristics

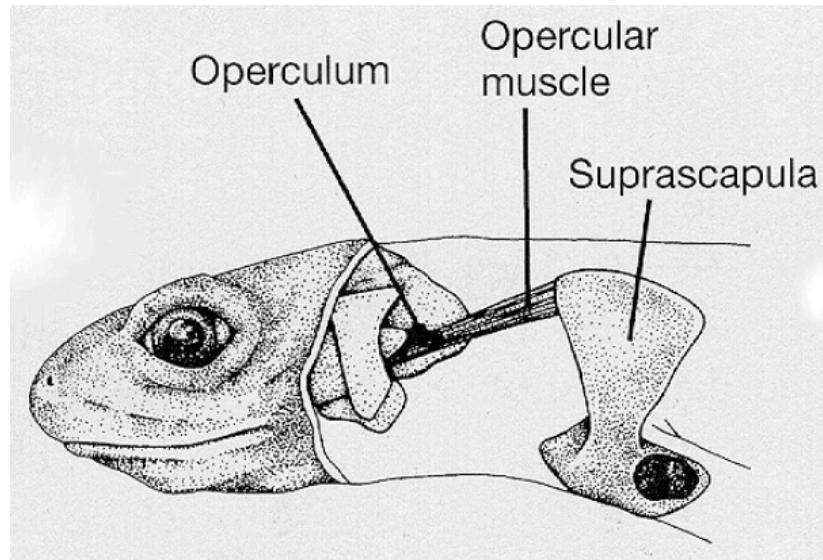
- **Loss of bones** in the skull (many cartilaginous elements)
- Lack middle ear cavities and tympana
- Sternum present



Duellman and Trueb 1986

Diagnostic Characteristics

- **Loss of bones in the skull**
- Lack middle ear cavities and tympana
- Sternum present



Pough et al. 2004

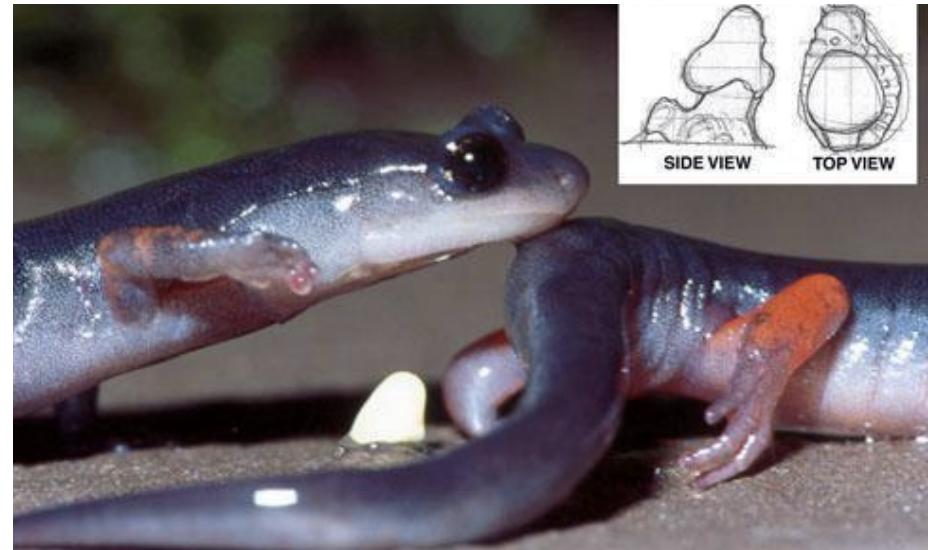
Diagnostic Characteristics

- Mucus and poison glands in skin – aggregations called
COURTSHIP GLANDS



Diagnostic Characteristics

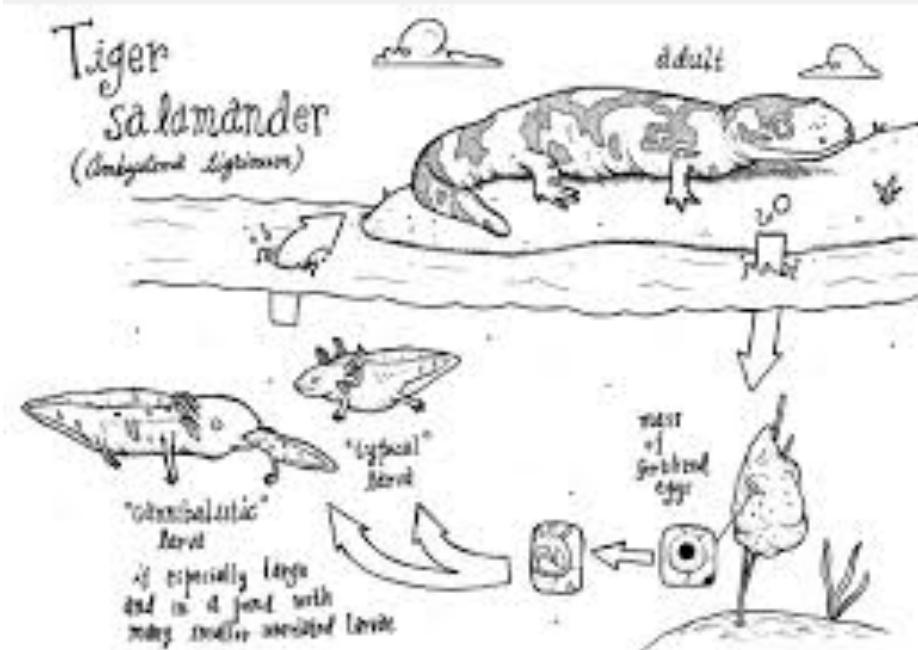
- Derived lineages have internal Fertilization **via SPERMATOPHORE (>90%)**
- MOST are oviparous



Plethodon.science.oregonstate.edu

Diagnostic Characteristics

- Development:
 - Primarily EXTERNAL
 - Larval Stage (ancestral)
 - Direct Development (> 300 spp of Plethodontids)



Diagnostic Characteristics

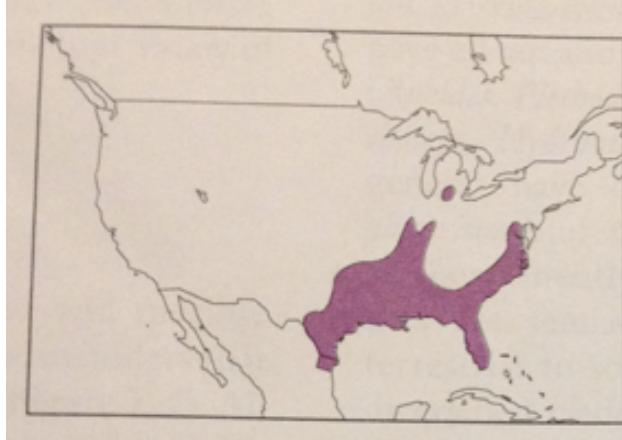
- Larvae with true teeth, bony skeleton, different palate, gill slits or external gills



Sirens and Dwarf Sirens

Clade: Sirenidae

2 Genera, 4 Species



- Pelvic girdle and hindlimbs **ABSENT**
- **Adults: 10 – 90 cm TL**
- Keratinized beak
- Costal grooves ABOVE ribs
- **PAEDOMORPHIC FEATURES:**
 - NO eyelids
 - Gills and Gill slits
 - Tail fin
 - Fewer digits



Asiatic Salamanders

Clade: Hynobiidae

9 Genera, 65 Species

- MOST are small (< 10cm TL)

- Complete Metamorphosis

- Eyelids

- Well Developed Lungs and Lack of Gill Slits
(Adults)

- Adults Terrestrial

- External Fertilization

- Spermatophore (*Ranodon sibericus*)



Giant Salamanders

Clade: Cryptobranchidae

2 Genera, 3 Species

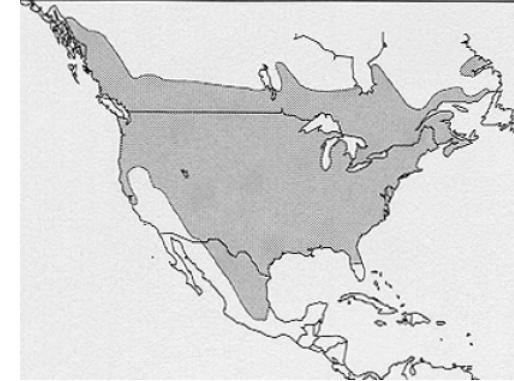
- EXTERNAL fertilization
- LARGEST living salamanders
- Fleshly skin folds
- Laterally compressed tail
- PAEDOMORPHIC FEATURES:
 - NO eyelids
 - ONE pair of gill slits
 - Tail fin
 - NO tongue pad



Mole Salamanders

Clade: Ambystomatidae

1 Genus, 32 Species



- Fossorial
- Hefty
- Facultative or obligate metamorphosis
- Tubercles
- Costal grooves
- Cloacal glands



©2005 Mike Graziano

Pacific Giant Salamanders

Clade: Dicamptodontidae

1 Genus, 4 Species

- Often paedomorphic (obligate in *D. copei*)
- Inhabit cold streams
- NO tubercles
- Less distinct costal grooves



Newts, Brook and Fire Salamanders



Clade: Salamandridae
21 Genera, 114 Species

- Rough Skin
- Toxic Secretions
- **APOSMATIC** Coloration
- NO costal grooves



Olm, Mudpuppy, and Waterdog

Clade: Proteidae

2 Genera, 6 Species

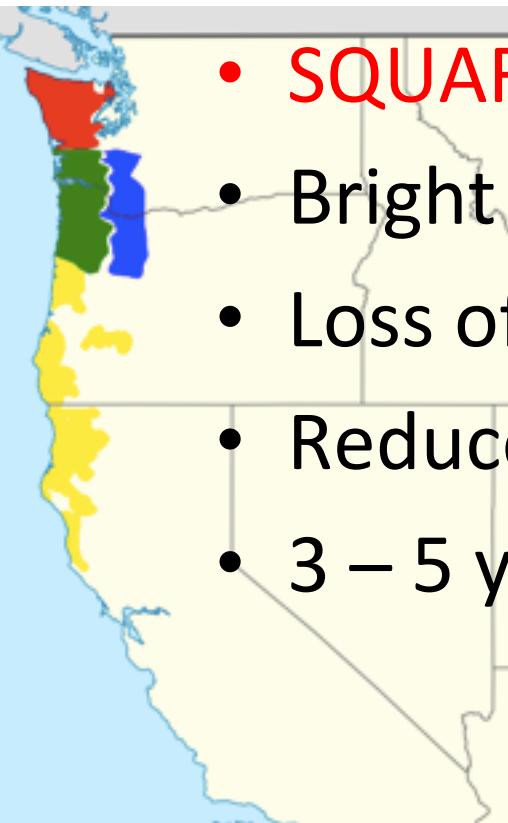
- Aquatic
- Nasals absent
- Laterally compressed tails
- Reduced number of toes
- PAEDOMORPHIC CHARACTERS:
 - LARGE Gills
 - Caudal fins
 - 4 toes on hind feet
 - Weak costal grooves
 - No eyelids



Olympic (Torrent) Salamanders

Clade: Rhyacotritonidae

1 Genus, 4 Species



- **SQUARED** Gland posterior to vent
- Bright **YELLOW** ventral coloration
- Loss of opercular apparatus
- Reduced lungs
- 3 – 5 year larval stage

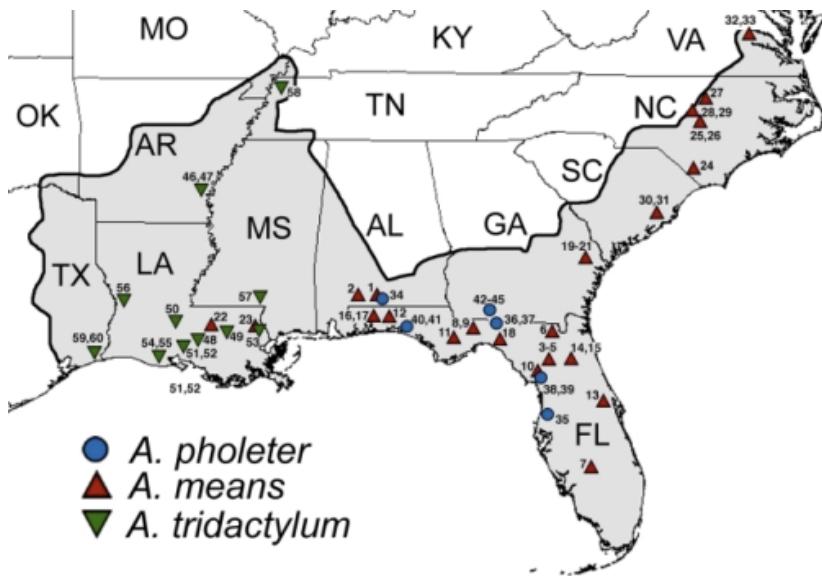


Amphiumas

Clade: Amphiumidae

1 Genus, 3 Species

- Aquatic and eel-like
- PAEDOMORPHIC CHARACTERS:
 - NO eyelids
 - Gill Slits
 - 4 REDUCED LIMBS
 - Reduced toes (3, 2, or 1)
 - Lateral Line





Lungless Salamanders

Clade: Plethodontidae

26 Genera, 451 Species



Mike
Bennard

- **LUNGLESS**
- Nasolabial grooves
- Modified hyoid – tongue projection
- 4 fingers, 5 toes (may be reduced)